

Compact Microscope Imaging System Developed

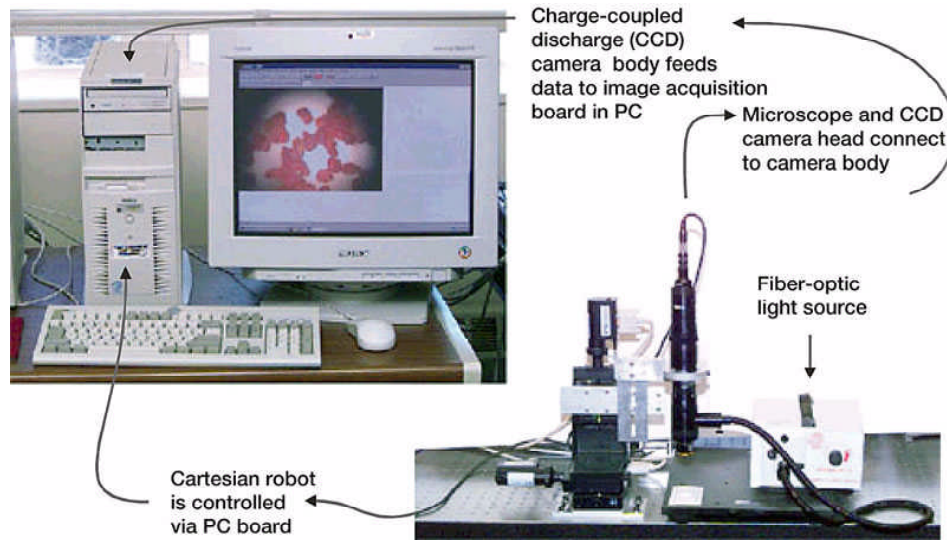
The Compact Microscope Imaging System (CMIS) is a diagnostic tool with intelligent controls for use in space, industrial, medical, and security applications. The CMIS can be used in situ with a minimum amount of user intervention. This system, which was developed at the NASA Glenn Research Center, can scan, find areas of interest, focus, and acquire images automatically. Large numbers of multiple cell experiments require microscopy for in situ observations; this is only feasible with compact microscope systems.

CMIS is a miniature machine vision system that combines intelligent image processing with remote control capabilities. The software also has a user-friendly interface that can be used independently of the hardware for post-experiment analysis.

CMIS has potential commercial uses in the automated online inspection of precision parts, medical imaging, security industry (examination of currency in automated teller machines and fingerprint identification in secure entry locks), environmental industry (automated examination of soil/water samples), biomedical field (automated blood/cell analysis), and microscopy community.

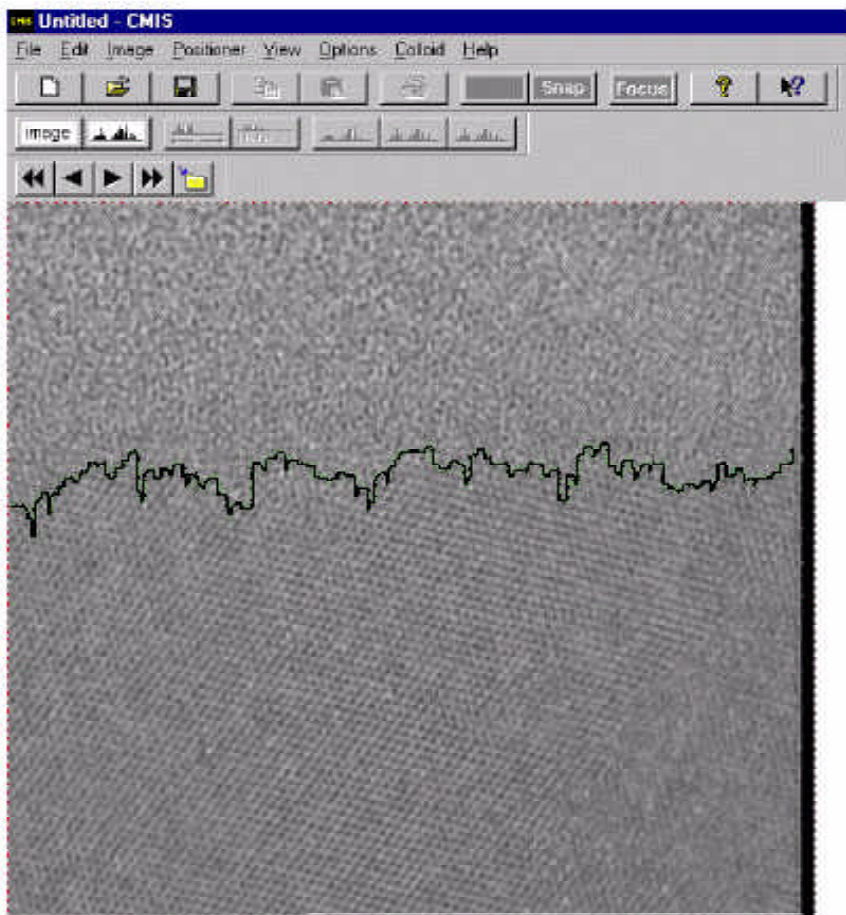
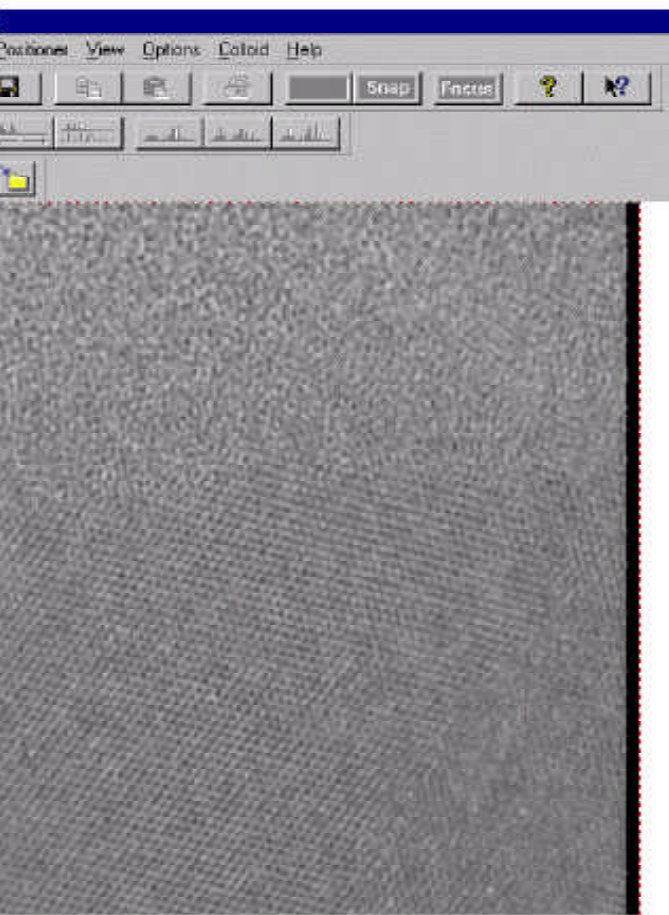
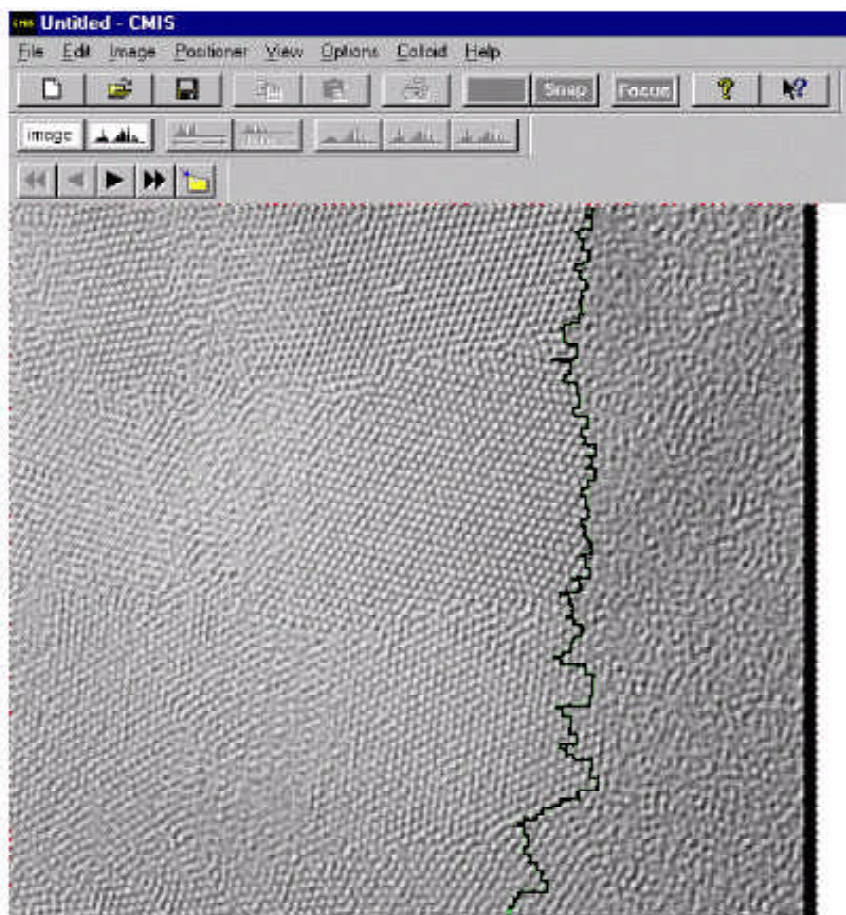
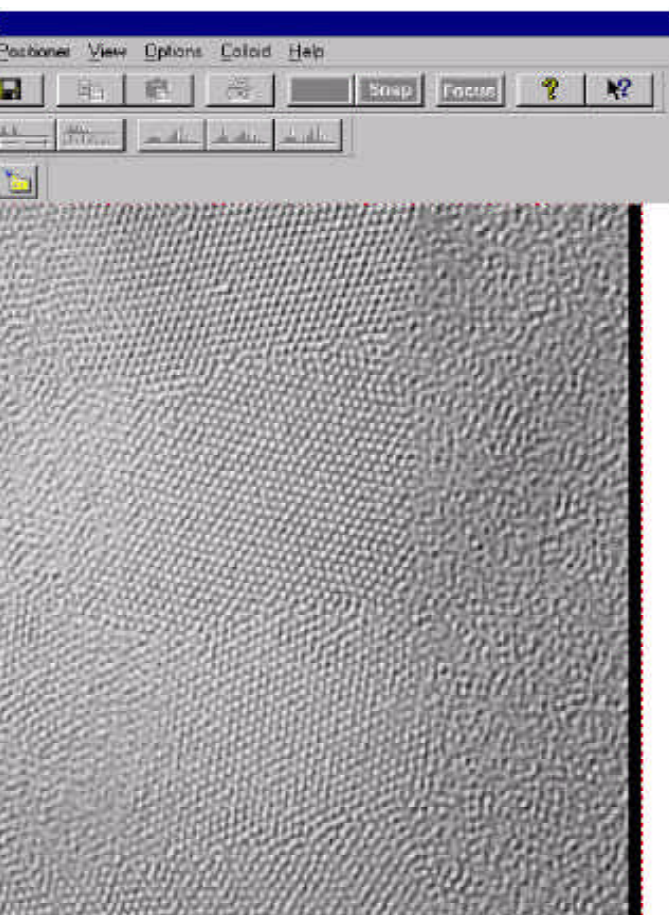
CMIS will improve research in several ways:

1. It will expand the capabilities of MSD experiments utilizing microscope technology.
2. It may be used in lunar and Martian experiments (Rover Robot).
3. Because of its reduced size, it will enable experiments that were not feasible previously.
4. It may be incorporated into existing shuttle orbiter and space station experiments, including glove-box-sized experiments as well as ground-based experiments.



Compact Microscope Imaging System (CMIS).

This is a true innovation in the field of microscopy and will be incorporated into future microscopy experiments in the microgravity program. The work of the CMIS research team (Dr. Mark McDowell, Stephanie Grasson, Elizabeth Gray, and Rick Rogers) was such a significant contribution to science that it has won the Imaging Solution of the Year award from Advanced Imaging for the field of medical imaging, bioscience, and scientific analysis.



Automatic phase-change detection has finally been accomplished. After image averaging, brightness slicing, and optimal filtering to isolate the solid area, the CMIS algorithm traces the contours to find the largest solid region, which determines the interface (dark green line). Top left: Raw data exhibiting vertical disorder/order interface. Top right: Interface located by CMIS is shown as a dark green line. Bottom left: Raw data exhibiting disorder/order interface. Bottom right: Interface located by CMIS is shown as a dark green line.

Find out more about CMIS.

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Programs/Projects: Microgravity Science

Special recognition: Imaging Solution of the Year award from Advanced Imaging for the field of medical imaging, bioscience and scientific analysis. Advanced Imaging magazine is an international magazine that highlights the latest state-of-the-art advancements in imaging processing.